Table of Standard Integrals

$$\int x^n\,dx = \tfrac{x^{n+1}}{n+1} + C \quad (n \neq -1),$$

$$\int \tfrac{dx}{x} = \ln|x| + C,$$

$$\int \tfrac{dx}{a^2+x^2} = \tfrac{1}{a}\arctan\tfrac{x}{a} + C,$$

$$\int \tfrac{dx}{x^2-a^2} = \tfrac{1}{2a}\ln\left|\tfrac{x-a}{x+a}\right| + C,$$

$$\int \tfrac{dx}{\sqrt{a^2-x^2}} = \arcsin\tfrac{x}{a} + C,$$

$$\int \tfrac{dx}{\sqrt{x^2+a^2}} = \ln\left|x+\sqrt{x^2+a^2}\right| + C,$$

$$\int e^{ax}\,dx = \tfrac{1}{a}e^{ax} + C,$$

$$\int a^x\,dx = \tfrac{a^x}{\ln a} + C,$$

$$\int \sin ax\,dx = -\tfrac{1}{a}\cos ax + C,$$

$$\int \cos ax\,dx = \tfrac{1}{a}\sin ax + C,$$

$$\int \tan ax\,dx = -\tfrac{1}{a}\ln|\cos ax| + C,$$

$$\int \cot ax\,dx = \tfrac{1}{a}\ln|\sin ax| + C,$$

$$\int \tfrac{dx}{\sin^2 ax} = -\tfrac{1}{a}\cot ax + C,$$

$$\int \tfrac{dx}{\cos^2 ax} = \tfrac{1}{a}\tan ax + C,$$

$$\int \sinh ax\,dx = \tfrac{1}{a}\cosh ax + C,$$

$$\int \cosh ax\,dx = \tfrac{1}{a}\sinh ax + C,$$

$$\int \tanh ax\,dx = \tfrac{1}{a}\ln|\cosh ax| + C,$$

$$\int \coth ax\,dx = \tfrac{1}{a}\ln|\sinh ax| + C,$$

$$\int \tfrac{dx}{\sinh^2 ax} = -\tfrac{1}{a}\coth ax + C,$$

$$\int \tfrac{dx}{\cosh^2 ax} = \tfrac{1}{a}\tanh ax + C,$$

$$\int \ln ax\,dx = x\ln ax - x + C,$$

$$\int xe^{ax}\,dx = \tfrac{xe^{ax}}{a} - \tfrac{e^{ax}}{a^2} + C,$$

$$\int x\sin ax\,dx = \tfrac{\sin ax}{a^2} - \tfrac{x\cos ax}{a} + C,$$

$$\int x\cos ax\,dx = \tfrac{\cos ax}{a^2} + \tfrac{x\sin ax}{a} + C,$$

$$\int \sin ax\cos ax\,dx = -\tfrac{\cos 2ax}{4a} + C,$$

$$\int \sin^2 ax\,dx = \tfrac{x}{2} - \tfrac{\sin 2ax}{4a} + C,$$

$$\int \cos^2 ax\,dx = \tfrac{x}{2} + \tfrac{\sin 2ax}{4a} + C,$$

$$\int \sinh ax\cosh ax\,dx = \tfrac{\sinh 2ax}{4a} + C,$$

$$\int \sinh^2 ax\,dx = \tfrac{\sinh 2ax}{4a} - \tfrac{x}{2} + C,$$

$$\int \cosh^2 ax\,dx = \tfrac{\sinh 2ax}{4a} + \tfrac{x}{2} + C,$$

$$\int \arcsin\tfrac{x}{a}\,dx = x\arcsin\tfrac{x}{a} + \sqrt{a^2-x^2} + C,$$

$$\int \arccos\tfrac{x}{a}\,dx = x\arccos\tfrac{x}{a} - \sqrt{a^2-x^2} + C,$$

$$\int \arctan\tfrac{x}{a}\,dx = x\arctan\tfrac{x}{a} - \tfrac{a}{2}\ln(a^2+x^2) + C,$$

$$\int \operatorname{arccot}\tfrac{x}{a}\,dx = x\operatorname{arccot}\tfrac{x}{a} + \tfrac{a}{2}\ln(a^2+x^2) + C,$$

$$\int \tfrac{dx}{\sqrt{x^2-a^2}} = \ln\left|x+\sqrt{x^2-a^2}\right| + C,$$

$$\int \tfrac{dx}{x\sqrt{x^2-a^2}} = \tfrac{1}{a}\operatorname{arcsec}\left|\tfrac{x}{a}\right| + C,$$

$$\int \sec ax\,dx = \tfrac{1}{a}\ln|\sec ax + \tan ax| + C,$$

$$\int \csc ax\,dx = -\tfrac{1}{a}\ln|\csc ax + \cot ax| + C,$$

$$\int \operatorname{sech} ax\,dx = \tfrac{1}{a}\arctan(\sinh ax) + C,$$

$$\int \operatorname{csch} ax\,dx = \tfrac{1}{a}\ln\left|\tanh\tfrac{ax}{2}\right| + C,$$

$$\int \operatorname{arcsinh}\tfrac{x}{a}\,dx = x\operatorname{arcsinh}\tfrac{x}{a} - \sqrt{x^2+a^2} + C,$$

$$\int \operatorname{arccosh}\tfrac{x}{a}\,dx = x\operatorname{arccosh}\tfrac{x}{a} - \sqrt{x^2-a^2} + C,$$

$$\int \operatorname{arctanh}\tfrac{x}{a}\,dx = x\operatorname{arctanh}\tfrac{x}{a} + \tfrac{a}{2}\ln(a^2-x^2) + C,$$

$$\int x^2e^{ax}\,dx = \tfrac{x^2e^{ax}}{a} - \tfrac{2xe^{ax}}{a^2} + \tfrac{2e^{ax}}{a^3} + C$$